
Myocyte enhancer factor 2C as a neurogenic and antiapoptotic transcription factor in murine embryonic stem cells.

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Public Summary:

Scientific Abstract:

Cell-based therapies require a reliable source of cells that can be easily grown, undergo directed differentiation, and remain viable after transplantation. Here, we generated stably transformed murine ES (embryonic stem) cells that express a constitutively active form of myocyte enhancer factor 2C (MEF2CA). MEF2C has been implicated as a calcium-dependent transcription factor that enhances survival and affects synapse formation of neurons as well as differentiation of cardiomyocytes. We now report that expression of MEF2CA, both in vitro and in vivo, under regulation of the nestin enhancer effectively produces "neuronal" progenitor cells that differentiate into a virtually pure population of neurons. Histological, electrophysiological, and behavioral analyses demonstrate that MEF2C-directed neuronal progenitor cells transplanted into a mouse model of cerebral ischemia can successfully differentiate into functioning neurons and ameliorate stroke-induced behavioral deficits.

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